GAS TURBINE ENGINE COMBUSTOR HAVING TRAPPED DUAL VORTEX CAVITY

ABSTRACT OF THE DISCLOSURE

A gas turbine engine combustor trapped dual vortex cavity is defined between an aft wall, a forward wall, a bottom wall formed therebetween. A cavity opening is located at a top of the cavity, is spaced apart from the bottom wall and extends between the aft wall and the forward wall. Air injection first holes in the forward wall are positioned close to the bottom wall, air injection second holes in the aft wall are positioned approximately midway between the bottom wall and the opening. Fuel injection holes in the forward wall are located between the air injection second holes and the bottom wall. The exemplary embodiment of the invention includes first angled film cooling apertures disposed through the bottom wall and angled away from the forward wall. Second angled film cooling apertures are located in the forward wall between the fuel injection holes and the bottom wall and angled towards the bottom wall. Third angled film cooling apertures are located in the forward wall between the fuel injection holes and the opening and angled towards the opening. Top and bottom film cooling slots are disposed parallel to the aft wall and operable to flow and direct cooling air along the aft wall. An alternative embodiment does not use the bottom film cooling slot and has fourth angled film cooling apertures located between the air injection second holes in the aft wall and the bottom wall angled towards opening. A bottom wall cooling slot extends from the forward wall parallel to the bottom wall and is operable to direct and flow cooling air along the bottom wall.